

# Suicide in juveniles and adolescents in the United Kingdom

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**Background:** Suicide is a leading cause of death among youths. Comparatively few studies have studied recent trends over time, or examined rates and characteristics of service contact in well-defined national samples. **Methods:** Data on general population suicides and mid-year population estimates were used to calculate suicide rates (per 100,000/year) among youths aged 10–19 years in the United Kingdom. We then determined the proportion of youths who had been in mental health service contact in the year prior to death. Social and clinical data were collected via questionnaires sent to clinicians who had provided care. **Results:** The general population rate of suicide was higher in males than females, and was higher in 15–19-year-olds compared to 10–14-year-olds. Suicide rates for 10–19-year-olds declined by 28% between 1 January 1997 and 31 December 2003 (compared with an 8% reduction in those aged >19 years); the fall was particularly marked for males. Mental health service contact was low at 14% (compared with 26% for adults), especially for males (12%). Youths in mental health contact were characterised by: diagnosis of affective disorder, mental illness history, residential instability, self-harm, and substance misuse. Over half of youths were living with parents and one-fifth were in full-time education. **Conclusions:** The suicide rate for 10–19-year-olds in the UK appeared to fall between 1997 and 2003. Further monitoring of suicide rates is needed to determine whether this trend has continued for the most recent years (e.g., 2004–7). The fall in rates may have been related to socio-economic or clinical factors. The rate of contact with services was low compared to adults, particularly in males. This is concerning because young males have the highest suicide rate in the UK. Suicide prevention in young people is likely to require a multi-agency approach. **Keywords:** Suicide, children, adolescents, mental health services, mental illness.

Suicide is one of the leading causes of death among young people worldwide (Agritmis, Nesime, Colak, & Aksoy, 2004; Gould, Greenberg, Velting, & Shaffer, 2003; Gunnell, 2000). It makes a significant contribution to the mortality rates of young people and has a substantial impact on the potential life years lost (Gunnell & Middleton, 2003; Gunnell, 2000). The World Health Organisation (WHO) report suicide rates of .4 and 1.5 per 100,000 population for 5–14-year-old females and males (WHO Statistical Information System, 2000). In a review of child and adolescent suicide, Pelkonen and Marttunen (2003) cited international suicide rates for adolescents 15–19 years reported by WHO. Rates were presented by sex, for a 2-year average. These varied substantially for males (.2 per 100,000 population in Azerbaijan to 34.5 per 100,000 population in the Russian Federation) and females (.0 per 100,000 in Armenia to 17.1 per 100,000 population in New Zealand).

Reporting suicide rates for children across a wide age range (e.g., 5–14 years) is problematic. The suicidal intentions of children under 10 years of age are difficult to establish (Mishara, 1999) and misclassification of young deaths may lead to under- or over-reporting of suicide cases (Groholt & Ekeberg, 2003). As such, the scale of the problem for younger and older children is obscured and rates are difficult to interpret. Further, international rates reported for 15–19-year-olds vary widely. This may in part be accounted for by social and cultural factors and a lack of consistency in the data collection (e.g., classification of suicide cases; years for which data are available) (Pelkonen & Marttunen, 2003).

There has been little consistency in the direction of suicide trends reported for children 10–14 years, with studies reporting decreasing (Dervic et al., 2006), increasing (Beautrais, 2001; Groholt, Ekeberg, Wichstrom, & Haldorsen, 1998) and stable (McClure, 2001; McClure, 1994) rates. Among 15–19-year-old adolescents, the rates of suicide have been reported as increasing, particularly among males (McClure, 2001; McClure, 1994), although internationally, there has also been variation in the direction of suicide trends reported for this age group (Madge, 1999). The difficulty in interpreting trends in

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suicide among young people may in part be due to methodological differences between studies. The inconsistency with which suicide verdicts are given to young suicide cases may impact on the reported trends for children (Groholt & Ekeberg, 2003). For both juveniles and adolescents, different time periods (Beautrais, 2001; McClure, 1994; Kelly & Bunting, 1998) and populations (Beautrais, 2001; McClure, 2001; Lee, Collins, Burgess, 1999; Madge, 1999; Groholt et al., 1998) have been examined; rates have also been presented for suicide and undetermined verdicts separately (McClure, 2001; Madge, 1999; McClure, 1984, 1994).

Mental health problems are a common feature of youth suicide. The majority of adolescents and approximately two-thirds of juveniles have had at least one major psychiatric diagnosis prior to their suicide (Gould et al., 2003; Beautrais, 2001; Groholt et al., 1998; Shaffer et al., 1996), most commonly depression (Pelkonen & Marttunen, 2003; Gould et al., 2003; Marttunen, Aro, Henriksson, & Lonnqvist, 1991; Shaffer et al., 1996). This could suggest a central role for mental health services in the prevention of youth suicide. Despite the prevalence of mental health problems in this population, there is no consistency in the literature on the rate of contact among youths with mental health services prior to death. This may be due to methodological differences between studies. For example, subjects have varied in age from 10 to 25 years (Runeson, 1989; Agerbo, Nordentoft, & Mortensen, 2002; Houston, Hawton, & Sheppard, 2001; Hawton, Houston, & Sheppard, 1999; Marttunen, Aro, & Lonnqvist, 1992), and the rarity of suicide as an outcome may also make estimates of rates of service contact unreliable (Agerbo et al., 2002; Houston et al., 2001; Booth & Owens, 2000; Runeson, 1989; Marttunen et al., 1992). Further methodological differences include: different data sources (e.g., psychological autopsy, register based data) (Agerbo et al., 2002; Booth & Owens, 2000; Houston et al., 2001; Hawton et al., 1999; Marttunen et al., 1992), varying time periods (e.g., 1 to 16 years) (Agerbo et al., 2002; Mortensen, Agerbo, Eriksson, Qin, & Westergaard-Nielsen, 2000; Marttunen, Henriksson, Aro, Heikkinen, Isometsa, & Lonnqvist, 1995; Marttunen et al., 1992), different definitions of contact (e.g., in-patient admission, community patient) (Agerbo et al., 2002; Runeson, 1989; Marttunen et al., 1992; King & Barraclough, 1990) and different time periods of contact (e.g., within 6 months of suicide, within 1 year of suicide, lifetime contact with services) (Agerbo et al., 2002; Pelkonen & Marttunen, 2003; Runeson, 1989; Marttunen et al., 1995, 1992). Higher rates have been reported for any lifetime contact with mental health services (Runeson, 1989) while lower rates have been reported for cases with an in-patient admission, particularly a recent in-patient admission (Agerbo et al., 2002; King & Barraclough, 1990), although this is not consistently the case. It is

important to determine accurate rates of service contact to assess the potential contribution of mental health services to suicide prevention in juveniles and adolescents.

In the current paper we sought to address the methodological limitations of previous studies. Previous studies have largely included small, unrepresentative samples, cross-sectional data or short follow-up periods, and there have been few studies examining the characteristics of young people in contact with mental health services. The current study will address the methodological limitations of previous studies and add to the current knowledge base of young suicides by providing recent data on the rates of a national sample of young people over a 7-year period. Further, there are significant gaps in the current literature on the rates of mental health contact among young people and the features that characterise them. This study will address this knowledge gap by providing rates of mental health contact among a young national population and the detailed socio-demographic and clinical features of this population. To summarise, we have addressed the limitations of previous studies by focusing on a recent, national, 7-year sample of juveniles and adolescents in the United Kingdom aged 10–19 years, using a comprehensive and well-established data collection system, the National Confidential Inquiry into Suicide and Homicide by People with Mental Illness (hereafter referred to as the Inquiry (Appleby et al., 2006)).

The overall aims of the current study were to examine recent trends in suicide and rates of service contact prior to suicide in young people. Our specific objectives were to:

1. estimate rates of suicide in those aged 10–19 years in the UK general population and examine trends in these rates;
2. determine the proportion of young people in the UK in contact with mental health services in the 12 months prior to death (1997–2003);
3. describe the demographic, psychosocial and clinical characteristics of this UK clinical sample.

## Method

### *Subjects and setting*

We defined young people as between 10 and 19 years of age (McClure, 2001; Groholt et al., 1998). Suicide deaths in children aged 10–14 were termed juvenile suicides, while suicide deaths in the 15–19-year-old group were termed adolescent suicide (Agritmis et al., 2004). Suicide deaths in adults aged 20 years and above were termed adult suicides. The setting of the study was the whole of the United Kingdom 1997–2003. We collected information both on suicide in the general population and more detailed clinical data on those who had been in contact with mental health services in the 12 months before death.

### General population suicide data

Annual suicide data for the general population were obtained from the Office for National Statistics (ONS) for England and Wales, and the General Register Office (GRO) for Northern Ireland and Scotland for the time period 1 January 1997 through 31 December 2003. These organisations are the definitive sources for general population data in the respective countries. Mid-year population estimates for five-year age bands were obtained for the UK from National Statistics Online from 1997 through 2003 to calculate the rate of suicide among the young general population 10–19 years of age and those aged 20 years and above (adults) (per 100,000 per year) (*Source*: National Statistics Online).

People with a coroner's verdict of suicide or undetermined death ('open verdict') are included in the sample and are referred to as cases of suicide in the remainder of the paper. Official suicide statistics in the UK are also based on this definition of suicide (e.g., suicide and open verdicts) (*Source*: Office for National Statistics). Linsely, Schapira, and Kelly (2001) carefully examined coroners' records of all cases with an open or suicide verdict in Newcastle upon Tyne (UK) for the years 1985–94. The findings demonstrated that excluding open verdicts would have resulted in an almost 50% underestimate in the number of suicide deaths occurring during this time period. Further, it is commonly accepted that the burden of proof required to determine a verdict of suicide (e.g., the criminal standard of 'beyond reasonable doubt') is such that many cases would not meet this standard of proof despite clinical judgement to the contrary (O'Donnell & Farmer, 1995). Finally, underreporting of suicide is a particular problem in children and adolescents, which are often misclassified as accidental or undetermined deaths (Groholt et al., 1998; Shaffer, 1988). Therefore, cases with a verdict of suicide with ICD-10 Codes X60–X84 and Y87.0, and open verdicts with ICD-10 codes Y10–Y34, excluding Y33.9 (verdict pending) and Y87.2 (sequelae of events of undetermined intent), were included in the current study.

### Suicide deaths within 12 months of mental health contact

We collected detailed demographic, psychosocial and clinical data for those young people who had died by suicide within 12 months of contact with mental health services (hereafter referred to as Inquiry cases) (Appleby et al., 2006). The UK has a system of socialised health care and the majority of mental health care is provided as part of the National Health Service (NHS). There are very few private providers of mental health care, although the Inquiry also collects data from these sources.

Data were collected as part of the National Confidential Inquiry into Suicide and Homicide by People with Mental Illness, which collects information on all cases of suicide aged 10 and over. There are three stages to data collection for Inquiry cases. First, data on all suicides throughout England and Wales – irrespective of mental health care at the time of suicide – are provided to the Inquiry by the Office for National Statistics. Equivalent data on suicide cases occurring in Scotland and

Northern Ireland are provided via the General Register's Office in the respective countries. Second, data are sent to our administrative contacts within each mental health hospital throughout the United Kingdom, who identify those people who were in contact with mental health services in the 12 months prior to suicide. Contact includes patients receiving outpatient and in-patient care. The clinician who was caring for the patient prior to their suicide is then identified by our mental health hospital contact. This clinician is subsequently asked to complete the questionnaire based on their personal knowledge of the patient and the case notes relating to their care. Alternatively, another member of the mental health team caring for the patient prior to their suicide may also complete the questionnaire based on their personal knowledge of the patient and the case notes.

The Inquiry is a UK-wide case-series of all suicides by people in contact with mental health services in the 12 months prior to death or offence. Established at the University of Manchester (UK) in 1996, the Inquiry dataset is unique because of the comprehensive UK-wide data collection systems of suicides in a clinical population, which have now been in place for over a decade. The response rate of clinicians (i.e., the proportion who return the Inquiry questionnaire) is 97%, which reflects our long-standing relationship with mental health professionals nationally. The findings of the Inquiry have impacted on clinical practice and policy in the UK by providing definitive figures on suicide among mental health patients, which are quoted by government departments, the voluntary sector, and academics (Appleby et al., 2006).

Our ascertainment procedures are robust (Appleby et al., 2006). From the inception of the Inquiry in 1996 through 1999, local information on suicide and open verdict cases was forwarded to the Inquiry by Directors of Public Health (Appleby et al., 1999). This data was supplemented by national data provided by the Office for National Statistics (ONS) to ensure all cases of suicide or probable suicide were identified. Cross-checking using these local and national data sources showed that all cases identified by Directors of Public Health were also identified by ONS, although ONS data identified some cases that had been missed locally. The Inquiry now collects data from ONS only, as the definitive source of national suicide data.

Further, the Inquiry audited a random sample of 16 mental health hospitals to: 1) determine case ascertainment procedures and 2) determine the validity of the Inquiry questionnaires. The median rate across mental health hospitals in relation to case ascertainment (e.g., the mental health hospital contact identifying all cases who had contact with mental health services in the year prior to death, i.e., Inquiry cases) ranged from 98 to 100%. Concordance rates (between Inquiry researchers and clinicians) for key items on the questionnaire ranged between 90 and 100%.

The questionnaire is 25 pages in length and comprises 11 sections including: demographic information (e.g., age, sex), clinical history (e.g., primary psychiatric diagnosis; history of self-harm), and clinical management (e.g., treatment and compliance with medication; last contact with mental health services). Most items in the questionnaire are factual, but a



minority (for example, which factors may have made suicide less likely) are based on the opinion of the clinicians.

### Statistical analysis

For general population suicides, calendar year was fitted as a continuous variable in a log-linear Poisson model (with population offset) to test for linear trends in general population youth suicide rates over time (Kapur et al., 2006). Separate models for year and sex were also fitted to assess whether temporal trends differed by sex. The same analyses were carried out for Inquiry youth suicide rates.

The proportion of young suicides in contact with mental health services in the UK was calculated based on the number of all cases of youth suicide reported to the Inquiry and the number of cases of youth suicide identified by the Inquiry as having had recent contact with mental health services prior to their death. Descriptive details of young cases in contact with mental health services in the 12 months prior to their death were presented as proportions with 95% confidence intervals (CI). Subgroup analyses were carried out using chi square tests with statistical significance set at 5%. If an item of information was not known for a case, the case was removed from the analysis of that item. The denominator in all estimates was therefore the number of valid cases for each item. Intercooled STATA 9.0 for Windows 98/95/NT was used to carry out all analyses (STATA Corporation).

## Results

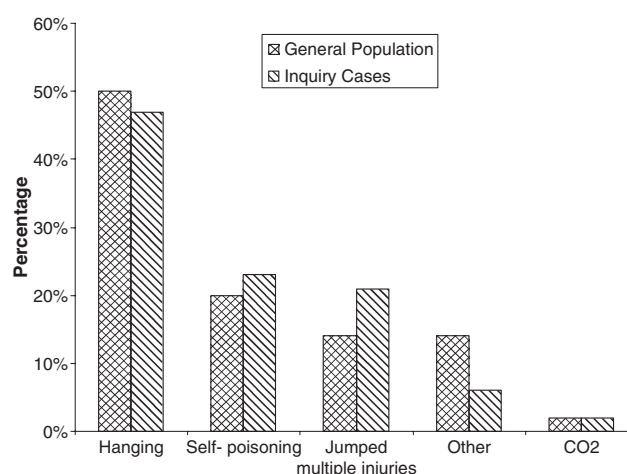
### General population deaths by suicide

From 1 January 1997 through 31 December 2003 the Inquiry was notified of 1,722 deaths by suicide in those aged 10–19 years in the UK, representing 4% of all general population suicides notified to the Inquiry ( $N = 42,844$ ) during the same time period. The number of suicide cases in each country is shown in Table 1. Of all young deaths by suicide, 1,288 were male and 434 female, giving a male to female ratio of 3:1. Hanging was the most common method of suicide, followed by self-poisoning (Figure 1).

Of all general population cases, 1,012 (59%) received a coroner's verdict of suicide and 710 (41%) received an undetermined verdict. Cases were similar in mean age (suicide verdict: 17.5 years; undetermined verdict: 17.1 years). As would be expected based on previous research, cases with a suicide

**Table 1** General population suicide and Inquiry cases by country

Country	General population cases	Inquiry cases
England	1,172	175
Wales	119	14
Scotland	330	39
N. Ireland	101	14
<b>Total</b>	<b>1,722</b>	<b>242</b>



**Figure 1** Method of suicide in the general population and among Inquiry cases of suicide. *Note.* Inquiry cases are excluded from the general population figures

verdict were more likely to die by hanging compared to cases with an undetermined verdict (62% vs. 31%;  $\chi^2 = 155.86$ ; d.f. 1;  $p < .001$ ). Cases with an undetermined verdict were more likely to die by poisoning (carbon monoxide poisoning: 3% vs. 1%;  $\chi^2 = 11.91$ , d.f. = 1;  $p = .001$ ; self-poisoning: 30% vs. 14%;  $\chi^2 = 59.46$ ; d.f. = 1;  $p < .001$ ).

One hundred and twenty-four (7%) of all young cases of suicide were juveniles (aged between 10 and 14 years), with a male to female ratio of 1.5:1. One thousand, five hundred and ninety-eight deaths by suicide (93%) were adolescents (aged between 15 and 19 years) with a male to female ratio of 3:1. In both age groups, hanging was the most common method of suicide followed by self-poisoning.

### Number and rate of suicide

**10–19 years (both genders).** The 1,722 suicides that were identified during the 7-year time period correspond to a suicide rate of 3.28 per 100,000 per year (95% CI: 3.12–3.43) (Table 2). The number of suicides by 10–19-year-olds declined from 249 in 1997 to 191 in 2003 (a reduction of 23%). The corresponding rate of suicide fell from 3.43 per 100,000 per year to 2.47 per 100,000 per year during the 7-year time period (a reduction of 28%).

**Males 10–19 years.** There were 1,288 suicides in 10–19-year-old males during the 7-year time period, representing an overall rate of suicide of 4.79 per 100,000 per year (95% CI: 4.54–5.06). The number of suicides by males aged 10–19 years declined from 195 in 1997 to 136 in 2003 (a reduction of 30%). The corresponding rate of suicide declined from 5.27 per 100,000 per year in 1997 to 3.42 per 100,000 per year in 2003 (a reduction of 35%). There was a significant linear trend (LR $\chi^2$  test for linear trend 22.10, d.f. = 1,  $p < .001$ ). The fall was probably more marked between 2000 and 2003 than in earlier years (Table 2).

**Table 2** UK general population youth suicide rates (per 100,000 per year) by year and gender, and the percentage of suicides in recent mental health contact (Inquiry cases) by year

Year	General population Males & females 10–19 years		General population Males 10–19 years		General population Females 10–19 years		Inquiry cases in contact with services	
	N	Rate (95% CI)	N	Rate (95% CI)	N	Rate (95% CI)	N	% (95% CI)
1997	249	3.43 (3.02–3.88)	195	5.27 (4.56–6.07)	54	1.51 (1.14–1.98)	33	13% (9%–18%)
1998	283	3.83 (3.40–4.31)	209	5.55 (4.83–6.36)	74	2.04 (1.60–2.56)	51	18% (14%–23%)
1999	257	3.45 (3.04–3.90)	195	5.13 (4.44–5.91)	62	1.70 (1.30–2.17)	35	14% (10%–18%)
2000	279	3.73 (3.30–4.19)	207	5.42 (4.71–6.21)	72	1.97 (1.54–2.48)	32	11% (8%–16%)
2001	231	3.05 (2.67–3.47)	179	4.62 (3.97–5.35)	52	1.41 (1.05–1.85)	38	16% (12%–22%)
2002	232	3.02 (2.65–3.44)	167	4.24 (3.62–4.94)	65	1.74 (1.34–2.22)	30	13% (9%–18%)
2003	191	2.47 (2.13–2.84)	136	3.42 (2.87–4.04)	55	1.46 (1.11–1.90)	23	12% (8%–18%)
<b>Total</b>	<b>1722</b>	<b>3.28 (3.12–3.43)</b>	<b>1288</b>	<b>4.79 (4.54–5.06)</b>	<b>434</b>	<b>1.69 (1.53–1.86)</b>	<b>242</b>	<b>14% (12%–16%)</b>

*Females 10–19 years.* There were 434 suicides among females aged 10–19 years during the 7-year time period, an overall suicide rate of 1.69 per 100,000 per year (95% CI: 1.53–1.86) – substantially lower than the suicide rate in young males (Table 2). There was no equivalent decline in the number of deaths by suicide or suicide rates in females (Table 2), and there was no evidence for a significant linear trend (LR $\chi^2$  test for linear trend .90, d.f. = 1,  $p$  = .342). However, the average female rate from 1998 to 2000 was higher (1.90 per 100,000; 95% CI: 1.65–2.18) than the average female rate for 2001–3 (1.54; 95% CI: 1.32–1.78).

*Juveniles (10–14 years) and adolescents (15–19 years).* The overall rate of suicide was .46 (95% CI: .38–.55) for 10–14-year-olds and 6.21 (95% CI: 5.91–6.53) for 15–19-year-olds. Rates were not calculated separately for juveniles (10–14 years) and adolescents (15–19 years) by year due to small numbers of deaths by suicide among juveniles.

#### *Proportion of youths in contact with mental health services (Table 2)*

Over the 7-year time period, 14% of young people in the UK who died by suicide were in contact with mental health services in the year prior to their death. The percentage of young people in contact with mental health services was significantly lower among males ( $N$  = 155; 12%) than females ( $N$  = 87; 20%) ( $\chi^2$  = 16.60; d.f. = 1;  $p$  < .001). There was no discernible trend in rates of contact.

#### *Description of Inquiry cases*

From 1997 to 2003, the Inquiry received questionnaires for 242 young cases of suicide in contact with mental health services in the 12 months prior to death. We achieved a response rate of 98% for England and Wales, 98% for Scotland and 93% for Northern Ireland across the 7-year time period. Cases aged 15–19 accounted for 98% of all young Inquiry cases. The number of cases in each country is shown in Table 1.

In 174 cases (73%), questionnaires were completed by the consultant responsible for the patient in the year prior to death. In 66 cases (26%), the respondent was not the consultant but another member of the clinical team who had known the patient personally. In 2 cases, this question was not answered.

*Characteristics of cases with a suicide and undetermined verdict.* In total, 167 cases (69%) received a verdict of suicide and 75 cases (31%) received an open verdict. Cases were similar in mean age (suicide verdict: 18 years; undetermined verdict: 17.9 years). Similar to the general population, those who used violent methods were more likely to receive a verdict of suicide (hanging:  $N$  = 94 (56%) vs.  $N$  = 20 (27%);  $\chi^2$  = 17.61; d.f. = 1;  $p$  < .001). With respect to socio-demographic features, cases with an open verdict were more likely to live alone ( $N$  = 21 (30%) vs. 20 (12%);  $\chi^2$  = 10.33; d.f. = 1;  $p$  = .001). Further, cases with a suicide verdict were more likely to have been a full-time student ( $N$  = 40 (25%) vs.  $N$  = 9 (13%);  $\chi^2$  = 4.20; d.f. = 1;  $p$  < .05). There were no differences between groups in regards to primary psychiatric diagnosis.

*All young Inquiry cases.* Across the 7-year time period, the total number of Inquiry cases declined from 33 in 1997 to 23 in 2003, a 30% reduction (LR $\chi^2$  test for linear trend 6.43, d.f. = 1,  $p$  = .011).

Table 3 lists the key characteristics of the Inquiry sample. Inquiry cases ranged in age from 13 to 19 years and the number of cases increased with increasing age. The male to female ratio was lower than that for the general population at 1.8:1. Methods of suicide were similar to the young general population cases, although Inquiry cases were more likely to die by jumping/multiple injuries ( $N$  = 51 (21%) vs.  $N$  = 200 (14%),  $\chi^2$  = 9.30; d.f. = 1;  $p$  < .002) (Figure 1). The most common methods were hanging, followed by self-poisoning and jumping from a height/lying before a train/lying before a road vehicle. Of the 43 Inquiry cases for which information on substance used to self-poison was available, the most common was an overdose of opiates (e.g.,

**Table 3** Social and clinical characteristics in those who died by suicide within 12 months of contact with mental health services

	N	Frequency	Percent	95% Confidence interval	
				Lower CI	Upper CI
Living circumstances					
Alone	231	41	18%	13%	23%
With parent(s)	231	139	60%	54%	67%
Homeless/no fixed abode	229	11	5%	2%	8%
B&B	229	2	1%	0%	2%
Hostel (supervised/unsupervised)	229	20	9%	5%	12%
Prison	229	4	2%	0%	3%
Employment					
In paid employment	231	37	16%	12%	21%
Unemployed	231	121	52%	46%	59%
Full-time student	231	49	21%	16%	27%
Long-term sick	231	15	6%	4%	10%
Behavioural characteristics					
History of self-harm	241	172	71%	65%	77%
Timing of last self-harm episode <3 months prior to suicide	241	22	9%	5%	13%
Timing of last self-harm episode >3 months prior to suicide	241	26	11%	7%	15%
History of alcohol misuse	233	124	53%	47%	60%
History of drug misuse	233	137	59%	52%	65%
History of any substance misuse	237	168	71%	65%	77%
Primary diagnosis					
Schizophrenia/other delusional disorders	232	45	19%	15%	25%
Affective disorders	232	72	31%	25%	37%
Substance dependence	232	18	8%	5%	12%
Personality disorder	232	40	17%	13%	23%
Adjustment disorder	232	16	7%	4%	11%
No mental disorder	232	14	6%	3%	10%
Time between last contact and suicide					
< 24 hours	239	44	18%	14%	24%
1–7 days	239	65	27%	22%	33%
1–4 weeks	239	47	20%	15%	25%
>4 weeks	239	82	34%	28	40%
Reason for last contact					
Routine/non urgent	239	150	63%	56%	69%
Urgent request by patient/family	239	12	5%	3%	9%
Urgent request by professional	239	18	8%	5%	12%
Assessment after deliberate self-harm	239	27	11%	8%	16%
Preventability					
Closer supervision of patients	220	61	28%	22%	34%
Better patient compliance	224	62	28%	22%	34%

heroin, methadone) ( $N = 13$ , 30%), followed by unspecified psychotropic drugs ( $N = 9$ , 21%), and paracetamol ( $N = 5$ , 12%). Sixteen (6%) cases died by other methods, which included drowning ( $N = 5$ ; 31%), firearms ( $N = 3$ ; 19%), and other self-injury (e.g., burning, suffocation, electrocution, suffocation) ( $N = 8$ ; 50%).

*Psychosocial characteristics.* Sixty percent of young people had been living with their parents prior to suicide and over one-fifth of cases were in full-time education. Compulsory school age in the UK is 5–16 years of age (Education Act, 1996). Of youths aged 10–16 ( $N = 25$ ), 17 (68%) were in full-time education; the other 8 youths were either in full-time employment or unemployed. Of the remaining youths ( $N = 206$ ), 32 (16%) were in full-time education; the other 174 youths were employed, unemployed, or on long-term sick leave. Sixteen percent of youths were not in stable living circumstances prior

to their death (e.g., homeless/no fixed abode, hostel, bed and breakfast accommodation, prison). Fifteen (15%) youths had been in local authority care and 8 (8%) had been in prison at some time prior to their death; all of these cases were adolescents aged 15–19 years. Three adolescents had been providing care for children under the age of 5 at the time of their death and 2 (1%) adolescent females had either been pregnant or had a child less than 1 year of age at the time of suicide.

*Clinical characteristics.* Affective disorder was the most common diagnosis, followed by schizophrenia. Rates of self-harm and substance abuse were high. The last episode of self-harm had been within 3 months of death in 22 cases (9%); in 26 cases (11%), the last episode had been longer than 3 months prior to death. Patients had been prescribed (and were thought to have been compliant with): oral typical anti-psychotics ( $N = 16$ , 10%), oral

atypical anti-psychotics ( $N = 26$ , 17%), lithium or mood stabilisers ( $N = 3$ , 2%), tricyclic antidepressants ( $N = 7$ , 5%), SSRI or SNRI antidepressants ( $N = 12$ , 8%), and other prescribed psychotropic drugs ( $N = 1$ , 1%).

In nearly half of all cases, final contact with services occurred between 24 hours and 7 days of committing suicide. The symptoms that were reported at last contact with services were: emotional distress ( $N = 73$ ; 31%); recent self-harm ( $N = 57$ ; 24%); depressive illness ( $N = 46$ ; 20%) and suicidal ideas ( $N = 32$ ; 14%). Contact was routine rather than urgent in 63% of cases, although in 24% of cases contact was initiated due to an urgent request by family/patient, professional, or following self-harm. Of those who were in contact with mental health services within 1 week of suicide (i.e., recent contact) the reason for contact was urgent in 16 cases (15%). This group of youths was no more likely to have had urgent contact with mental health services than those who had not been in recent contact ( $N = 16$  (15%) vs.  $N = 14$  (11%);  $\chi^2 = .79$ ; d.f. = 1;  $p > .05$ ). One-fifth of respondents ( $N = 44$ , 21%) thought that the suicide could have been prevented. The most common factors that respondents thought could have contributed to the prevention of the suicide were closer supervision of patients and better patient compliance.

## Discussion

Overall, the rate of suicide between 1997 and 2003 was 3.28 per 100,000 per year for 10–19-year-olds in the UK. The rate of suicide for those aged 20 years and older during this period was 13.34 per 100,000 per year (95% CI: 13.21–13.47) (Source: National Confidential Inquiry). The suicide rate was higher in young males than in young females and highest among 15–19-year-olds.

The rate of suicide among children and adolescents in the UK general population declined across the study period, particularly among males. The decrease in rates may reflect a general decline in suicide. However, the reduction in the rate of suicide in young people was greater than the equivalent reduction in the adult population (for both genders combined 28% vs. 8%; for males 35% vs. 9%) (Source: National Confidential Inquiry). This suggests a specific decline in youth suicides. However, further monitoring of suicide rates is needed to determine whether this trend has continued for the most recent years (e.g., 2004–7).

The proportion of young people in contact with mental health services in the UK was low at 14%. This compares with a rate of contact of 26% for adults aged 20 years and above during the same period (Source: National Confidential Inquiry). The rates of contact were lowest among young males, despite this group having higher rates of suicide than young females.

Demographic, psychosocial and clinical characteristics of young Inquiry cases were similar to the Inquiry sample as a whole (Appleby et al., 2006). However, there were a number of factors identified that were specific to this young population, including: living with parents; unstable living circumstances (e.g., homeless, prison); and engaged in full-time education.

## Methodological issues

The rare occurrence of suicide among young people limited the analysis and interpretation of the data, particularly among Inquiry cases. Data completeness by year varied from 99% to 94%, but running the analyses on projected figures (uplifted to reflect 100% completeness) made no difference to the results. It could be that there were changes in how coroners recorded deaths of young people during the study period. For example, while the rates of recorded suicides/open verdicts may have declined, rates of accidental death or misadventure may have increased across this same time period. However, we have no evidence that this was the case. Further, the period of monitoring was relatively short. Longitudinal monitoring of suicide will provide a clearer indication of suicide trends among juveniles and adolescents in the UK, both for general population and Inquiry cases.

This was a national, UK-wide study and the response rate for Inquiry cases was approximately 95% during the study period. However, our findings relating to Inquiry cases need to be interpreted in the context of a number of additional methodological limitations. The Inquiry is a descriptive clinical survey based on clinicians' judgements, not standardised interviews. However, previous studies have relied on this methodology (King et al., 2001) and a comprehensive review of Inquiry methods suggests our data collection procedures are robust (Appleby et al., 1999). We did not use structured interviews to generate psychiatric diagnoses – this would not have been feasible in a national study of this type. All the patients for whom we reported diagnoses had been in contact with services in the previous 12 months ('Inquiry cases'). The ICD-10 psychiatric diagnoses were the ones assigned by the clinicians who had cared for the patient. The process of diagnostic assignment is likely to be representative of clinical practice in the UK. The Inquiry methodology (essentially a very large case-series) can only highlight important antecedents to suicide. Although informative, aetiological conclusions cannot be drawn without a comparison sample. We presented our main findings with 95% confidence intervals. It could be argued that the use of confidence intervals is not necessary in this study, given that it includes the whole population. However, consistent with our previous reports and publications, we decided a priori to use confidence intervals to give an indication of



the likely precision of our incidence and prevalence estimates. Finally, the primary aim of the Inquiry is to identify clinical care in patients in the care of mental health services in the year prior to suicide. As such, only limited data on demographic and psychosocial variables are collected. Future studies should include more information on socio-economic and psychosocial factors of interest (e.g., educational background, history of social care, family history of suicide), which are common contributory factors to young suicides (Gould et al., 2003; Gould, Fisher, Parides, Flory, & Shaffer, 1996).

### *Interpretation of falling suicide rates*

We found that the rate of suicide in young people in the UK decreased significantly in the years 1997–2003, particularly for young men. Why might this be? Examination of routine data provides possible explanations but is limited because of inconsistencies in the availability of data by age group. In addition, such approaches can only determine whether factors are associated with suicide rates rather than casually linked. Measures of socio-economic activity such as employment rates and gross domestic product (GDP) indicate greater prosperity on a societal level during the period covered by this study (Office for National Statistics, National Statistics Online, 2007a). Drug and alcohol misuse are important risk factors for suicidal behaviour but there is no indication that these have declined in young people in the UK in recent years (The Information Centre, 2006). However, family breakdown among young people (as measured by divorce rates) has decreased (Office for National Statistics, National Statistics Online, 2007b). Two of the most important determinants of suicide risk are previous suicidal behaviour and psychiatric disorder. Self-harm and attempted suicide rates are not monitored on a UK-wide basis but data from one centre in England suggests that rates in young males are decreasing (Hawton et al., 2005). There is little evidence that rates of psychiatric disorder in young people have fallen recently or that help-seeking behaviour has changed (Green, McGinnity, Meltzer, Ford, & Goodman, 2005).

The rate of antidepressant prescribing to young people in the UK increased by more than 70% between 1992 and 2001 (Murray, de Vries, & Wong, 2004). This coincides with the time period of the current paper (1997–2003) in which rates of suicide among young people declined. However, the relationship between prescribing rates and suicide rates remains a hotly debated issue. Murray et al. (2004) showed that more than half of new antidepressant users with a diagnosis of depression discontinued treatment within two months. The short duration of drug treatment raises questions about the impact of antidepressant treatment on suicidal behaviour. Further, reports of an increase in suicidal behaviour

among some users of antidepressants (Gunnell & Ashby, 2004) have led to regulatory warnings in the US, UK and elsewhere regarding the prescription of SSRI and SNRI antidepressants to young people. In the UK this has led to a 27% decrease in prescriptions of antidepressants to those aged under 18 years between 2002 and 2004 (Murray, Thompson, Santosh, & Wong, 2005). Interestingly, data from the US and the Netherlands suggest such reduced prescribing may be associated with an increased rate of suicide (Gibbons et al., 2007). Our own preliminary data suggest that the overall suicide rate in young people aged 10–19 may have increased from around 2.5 per 100,000 in 2003 to 3.0 per 100,000 in 2004. However, numbers are still comparatively small, the time periods are short, and these data are difficult to interpret in the absence of age- and gender-specific suicide and prescription rates. The effect of decreased antidepressant prescribing on suicide rates in young people in the UK will need to be monitored.

Despite the possible impact of antidepressant prescribing on suicide rates, it seems unlikely that any single factor accounts for the recent fall in the rates of suicide in young people. A more plausible explanation is a combination of socio-economic and clinical factors. An analysis of suicide trends in England and Wales during the period 1950–98 concluded that increased family breakdown and income inequality might be the factors most consistently associated with increasing rates of suicide in young men (Gunnell, Middleton, Whitley, Dorling, & Frankel, 2003).

### *Clinical implications*

The relatively small percentage of clinicians who viewed the suicide of their patient as preventable is interesting. There may be a number of reasons that account for this. First, although suicide often occurs in the context of diagnosable psychiatric and substance abuse disorders which are treatable, there are specific patient groups (e.g., patients with a dual diagnosis of substance misuse and severe mental illness) whose suicide risk is more difficult to manage due to non-compliance with medication and non-attendance of clinical appointments. The low proportion of cases which clinicians thought was preventable may reflect the generally high suicide risk of mental health patients (Appleby et al., 2006).

Second, data collection is retrospective and clinicians assess the preventability of their patient's suicide in the context of the completed suicide. While the 'culture of blame' among health professionals is shifting to a 'culture of learning', it may be that this question is answered defensively in some cases. As such, fewer than expected clinicians may have responded that their patient's suicide was preventable. The sometimes defensive response to questions regarding preventability will only change if there is a



more pronounced shift away from blaming the clinician towards learning from serious adverse incidents (Appleby et al., 2006).

Further, there were very low levels of contact with mental health services among youths. There may be a variety of reasons for the low levels of contact, including: a reluctance to refer young people to specialist services, difficulties in diagnosing individuals in the earlier stages of their illness, low levels of mental disorder in this group, or difficulties in engaging young people in treatment. Although the proportion of youths in contact was low, research indicates that there are high levels of psychiatric morbidity in young people who die by suicide (Gould et al., 2003). Better access and engagement with mental health services may depend, in part, on good communication between primary and secondary care services in the first instance (Foreman, 2001). There is evidence to suggest that young people with psychiatric disorders do attend their GP surgery (Foreman, 2001; Kramer & Garraida, 2000). As such, GPs may play an important role in ensuring that the mental health needs of young people are met (Foreman, 2001).

The low rate of service contact in young males was particularly interesting. Young men aged 15–44 currently have the highest rates of suicide in the UK (Office for National Statistics, National Statistics Online, 2006). It may be that males in this age group have a higher threshold of severity before consulting their GP. Although the study sample was younger, the low rate of service contact may reflect a common difficulty in accessing services.

Despite a low level of service contact among all young cases of suicide, there was still an average of 35 youths per year who were in contact with mental health services in the year before death. It is difficult to formulate any specific recommendations for reducing suicide in this age group based on the results of this study. However, a multi-agency approach including health, social and education services may be the most effective strategy for preventing suicide in young people (Bridge, Goldstein, & Brent, 2006). Further research is needed to identify the specific risk factors associated with young suicide. In particular, research should be focused on the identification and relaxation of barriers to help-seeking in young males (Biddle, Gunnell, Sharp, & Donovan, 2004).

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